

WA3019
10 E
3/23/2015

Meeting regarding the Former J.H. Baxter Arlington Facility
March 23, 2015 10-12 AM

Attendees: Jan Palumbo, Rene Fuentes/EPA
Georgia Baxter, RueAnn Thomas, Heidi Blischke/Baxter

Preliminary Meeting Agenda

- I. Introductions
- II. Review Progress Reports and Quarterly Report Formats and Content
- III. Review Chem-Ox Report Results and Discussion
- IV. Propose Path Forward and Discussion
- V. Review Action Items and Path Forward

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USEPA RCRA



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EPA Meeting

J.H. Baxter Arlington

March 23, 2015

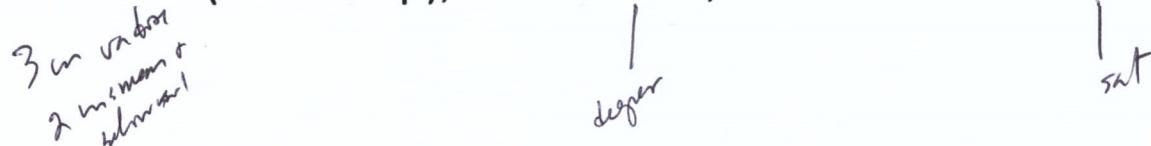
Chem-Ox Study

- Source Area Investigation
 - Soils
 - Groundwater
- Bench Scale Testing using Source Soils
- Evaluation of Source Area Data
- Conclusions and Recommendations

Soil Borings in Source Area

MBS & CMB
Univ. of Texas
2007
2007-03

- Confirm source area extent
 - Odor encountered first at 3.5 feet bgs where wood debris was present (SB-B)
 - NAPL impacted between 15 and 35 feet bgs in thickest area (SB-A)
 - Groundwater encountered between 29.5 and 33 feet bgs – smear zone around the water table makes up a large portion of the impacted area
 - Impacted volume is approximately 300,000 ft³
- Soil Samples Selected for Bench Scale Testing
 - According to flow chart – various soil types, PCP, and hydrocarbons
 - 5 samples from SB-A (and a dup), 2 from SB-C, and one from SB-D



Soil Results - General

- Soil Contaminants
 - TPH – heavily degraded
 - PCP highest in smear zone (with exception of SB-A where higher in interval above smear zone)
 - TPH also highest in smear zone
 - Nutrients and Bacteria in Soil
 - Deficient in nitrogen and phosphorus
 - TPH degrading bacteria are absent
 - PCP degrading bacteria present
- and no sig. viable spores*

Groundwater

- Collected from 5 wells
 - MW-11(upgradient)
 - MW-12 (source area)
 - MW-32 (near-source area)
 - MW-36 (mid-plume)
 - MW-41 (downgradient)
- Microbial Counts
- Analytical – chlorophenols, metals, dissolved gas

Groundwater Results

- Upgradient
 - oxic; deficient in nitrogen and phosphorus
- Source area
 - anoxic – (between iron and sulfate reduction)
 - Bacteria that degrade PCP anaerobically not present
 - bacteria that could support aerobic degradation of PCP present
 - Bacteria to degrade TPH not present
- Downgradient – close-in
 - Less reducing – higher ORP, no ferrous iron
 - Diesel range degrading bacteria present, and lower concentrations
 - Elevated chloride – PCP degradation?
- Down Plume
 - Low diesel range conc. – bacteria also not present
 - Bacteria that degrade PCP present in elevated masses and reduction in PCP concentrations.

+ aerobic

Degradation Potential

- High for aerobic degradation
 - Bacteria for aerobic degradation are present despite the low oxygen conditions, should rapidly increase with addition of oxygen
- Low for anaerobic degradation of PCP
 - Limited appropriate bacteria present in SB-A
 - Limited evidence at MW-12 of reductive dechlorination
(breakdown products present at low levels)

Total Oxidant Demand (TOD)

— how much oxygen required

- TOD testing showed a higher oxidant demand than initial work plan estimates
- Stoichiometric estimates using actual soil concentrations - resulted in a demand of 350 g/kg of soil from SB-A (24-27 feet) and 92 g/kg at SB-D (30-33 feet)
lower *higher*
FS est T = 3.3 g/kg
- Those 2 samples were carried forward into the effectiveness testing

Round 1 Effectiveness Testing

- Dosed at 46 g/kg and 92 g/kg in SB-A and 87.5 g/kg and 175 g/kg in SB-D
- Findings Round 1
 - PCP is more susceptible than DRO
 - High rates of PCP removal – best with alkaline persulfate
 - Residual oxidant remained high
- Round 2 conducted using lower doses of alkaline persulfate

?

Round 2 Effectiveness Testing

best m

- Dosed at 8, 16, and 23 g/kg using alkaline persulfate
- Findings:
- Effective usage of the persulfate best at about 23 g/kg achieving approximately 50% reduction in PCP mass
- To achieve higher reduction in mass, significant oxidant remains unused
- Review Figure 7

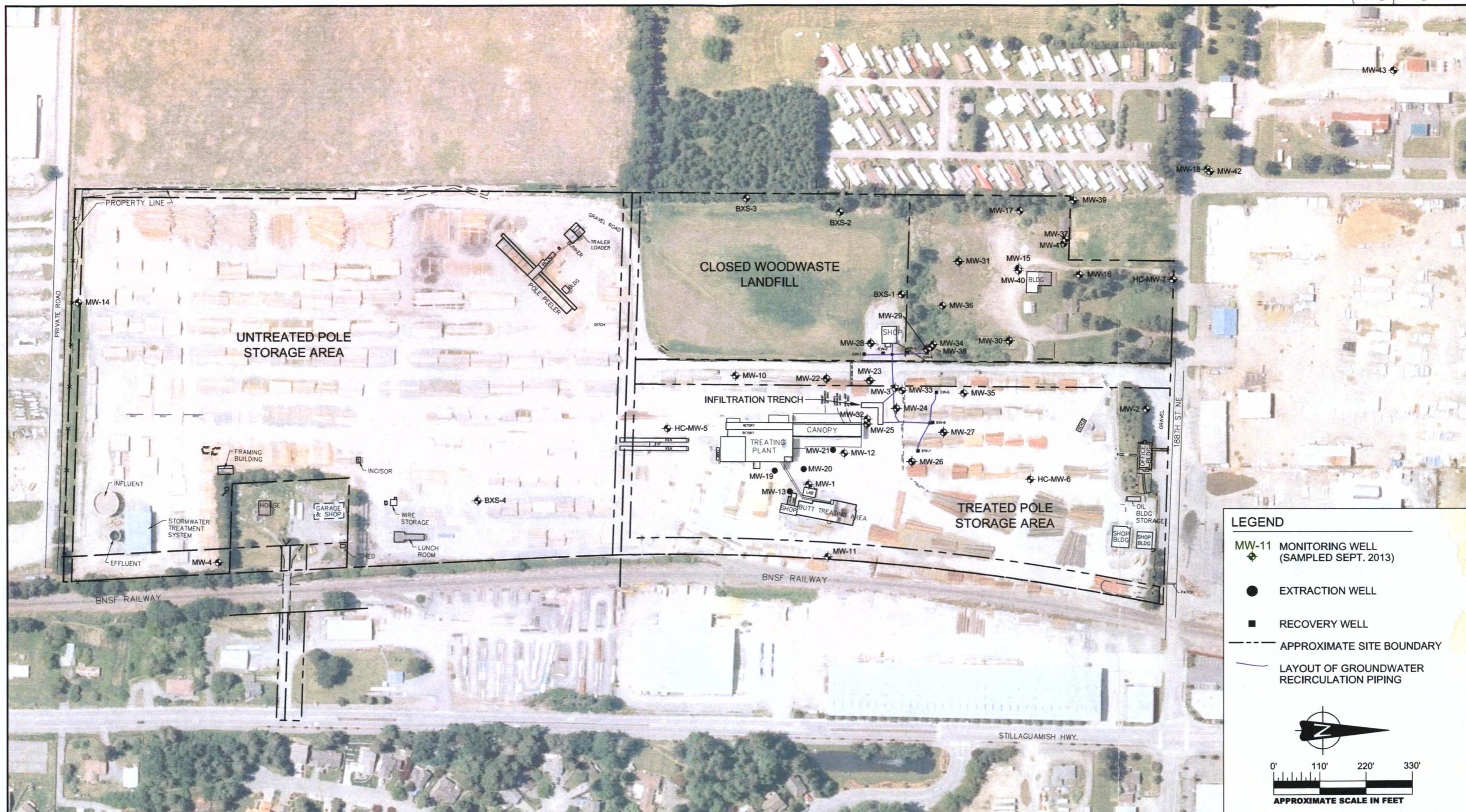
Conclusions

- Subsurface is amenable to aerobic biodegradation of PCP
- Chem-ox bench scale showed that 7 times that amount of persulfate as was estimated in the FS would be required to remove approximately 50% of the mass (up to 1 million lbs of persulfate)
- If attempt to remove additional mass; residual persulfate would remain unused
- Current system is accelerating aerobic degradation
 - Present of bacteria that degrade PCP aerobically
 - review PCP plume maps

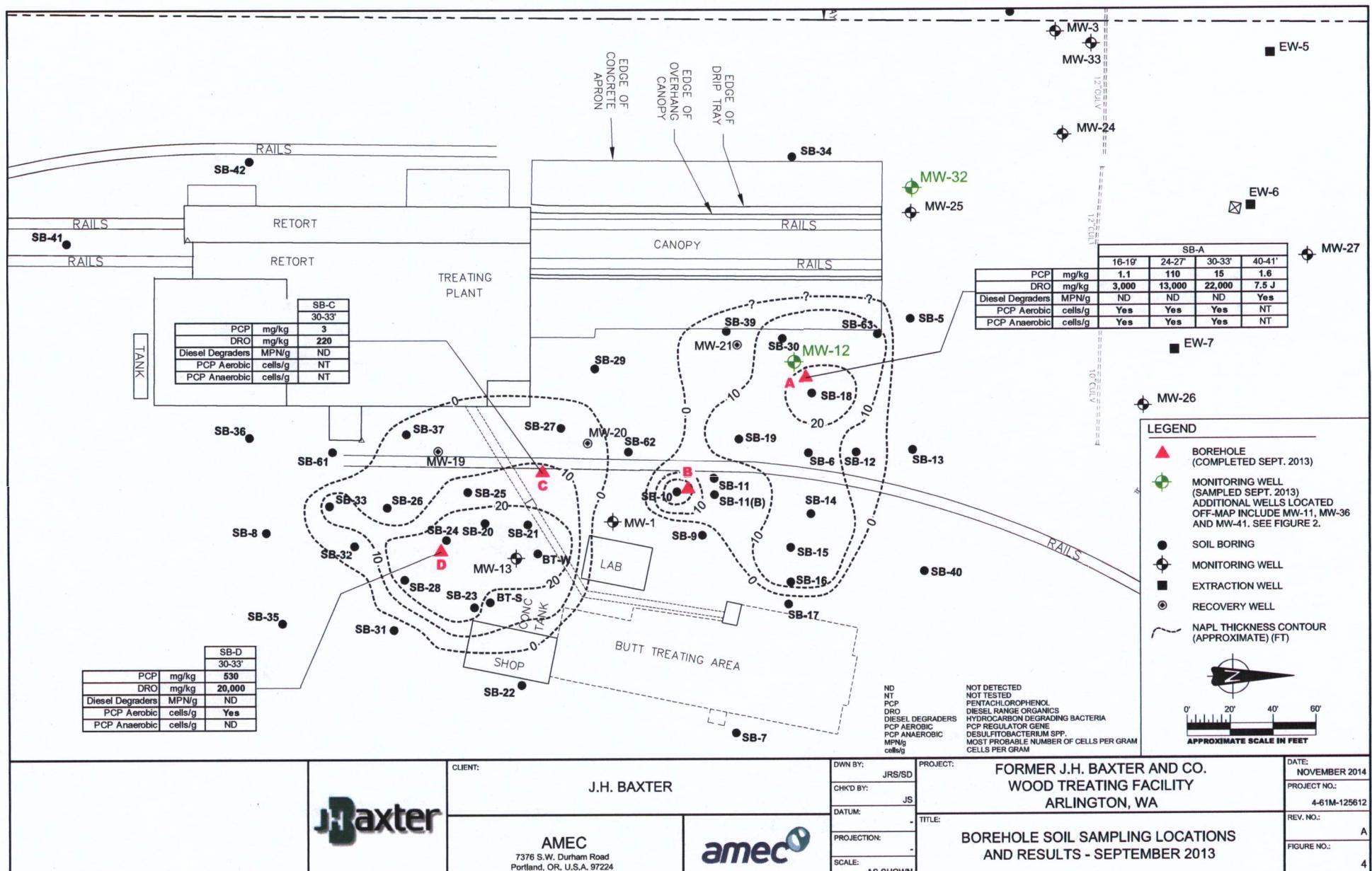
1 million lbs
remove 50%
unused.

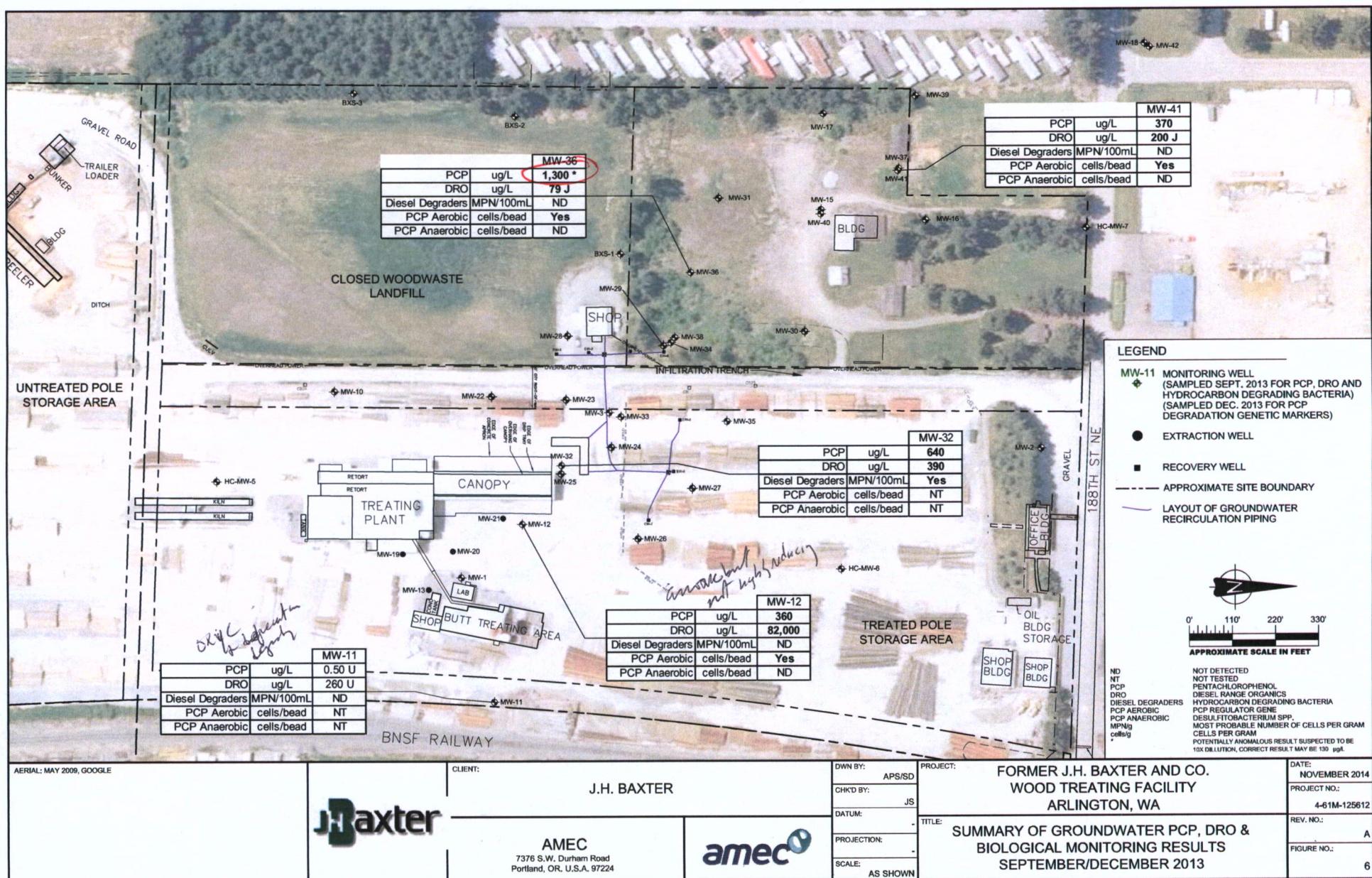
Recommendation

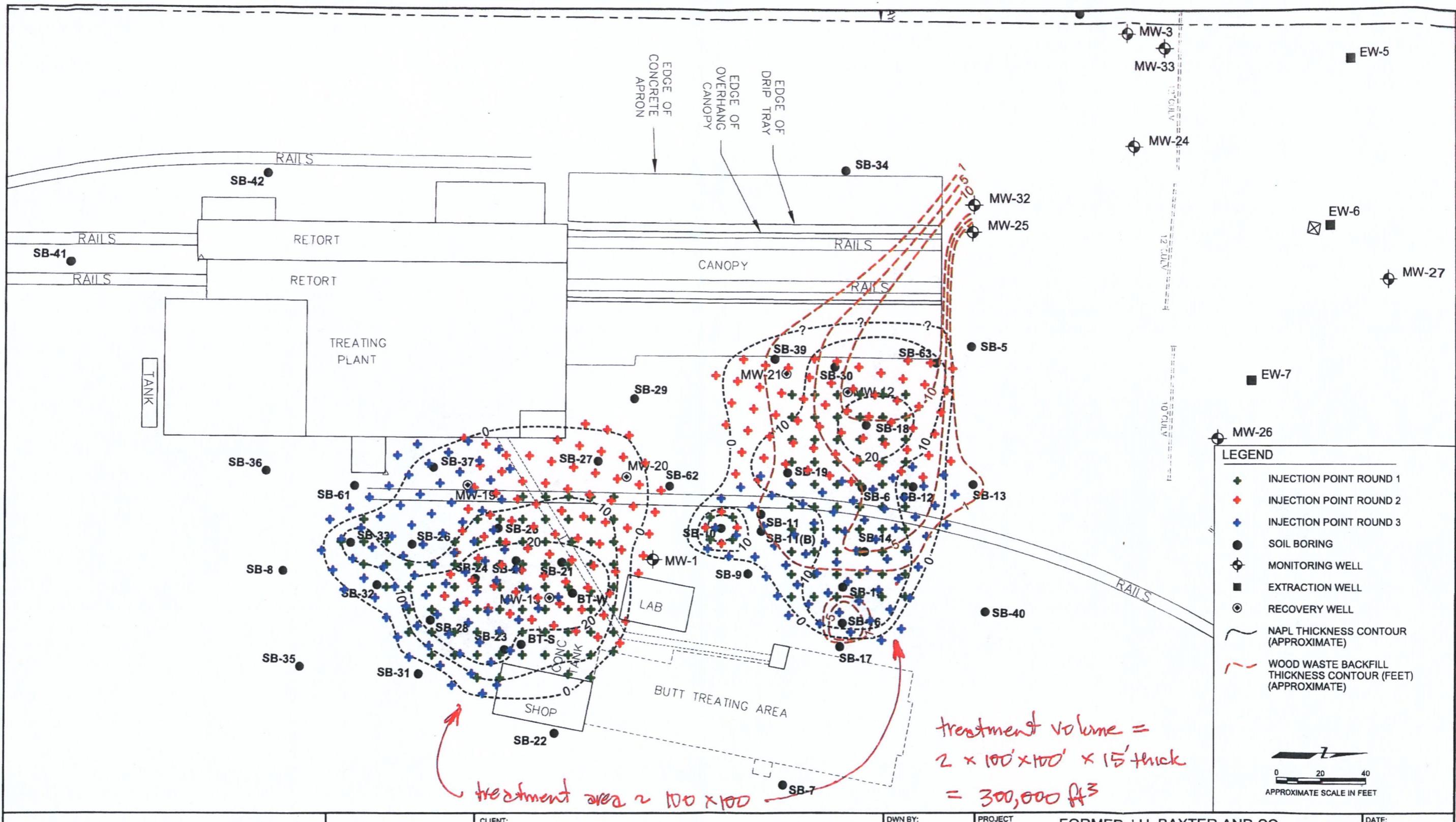
- Add iSOCs to 3 downgradient intermediate wells to enhance biodegradation of the cut-off plume
- Evaluate Recirculation trench to understand where the biofouling is occurring, discuss with EPA, and prepare a work plan to rehabilitate recirculation trench



AERIAL: MAY 2009, GOOGLE	CLIENT: J.H. BAXTER	DWN BY: APS/SD	PROJECT: FORMER J.H. BAXTER AND CO. WOOD TREATING FACILITY ARLINGTON, WA	DATE: NOVEMBER 2014
		CHK'D BY: JS		PROJECT NO.: 4-61M-125612
		DATUM:		REV. NO.: A
		PROJECTION:		FIGURE NO.: 2
		SCALE: AS SHOWN	SITE PLAN & GROUNDWATER MONITORING NETWORK	







	CLIENT: J.H. BAXTER	DWN BY: APS	PROJECT FORMER J.H. BAXTER AND CO. WOOD TREATING FACILITY ARLINGTON, WA	DATE: MARCH 2013
		CHK'D BY: SB	TITLE ALTERNATIVE 6 CHEMICAL OXIDATION AND ENHANCED BIODEGRADATION RECIRCULATION	PROJECT NO: 3-61M-125611
	AMEC 7376 S.W. Durham Road Portland, OR. U.S.A. 97224	DATUM: - PROJECTION: - SCALE: AS SHOWN	REV. NO.: A	
			FIGURE No. 9-6	

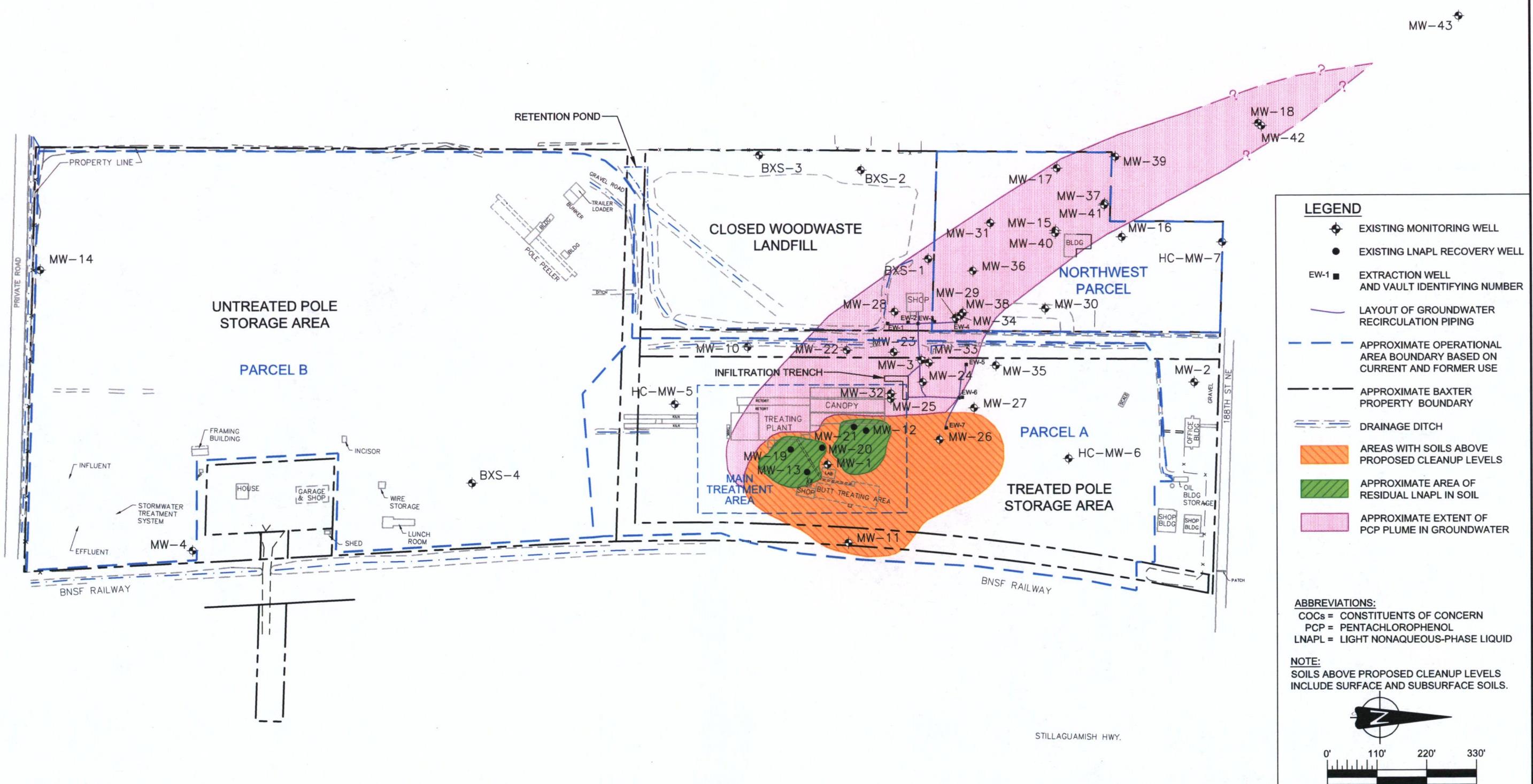


Figure originally published by AMEC in:
Corrective Measures Study - Revision 3
Former J.H. Baxter & Co. Wood Treating Facility, Arlington, Washington
April 2013



CLIENT:

J.H. BAXTER

AMEC
7376 S.W. Durham Road
Portland, OR. U.S.A. 97224



DWN BY:

APS/PM

CHK'D BY:

JS

DATUM:

-

PROJECTION:

SCALE:

AS SHOWN

PROJECT

FORMER J.H. BAXTER AND CO.
WOOD TREATING FACILITY
ARLINGTON, WA

TITLE

AREAS OF CONCERN

DATE:
NOVEMBER 2014

PROJECT NO:
4-61M-125612

REV. NO.:
A

FIGURE No.
3

FIGURE 7

Pentachlorophenol in Groundwater:
Fourth Quarter 2012 - Fourth Quarter 2014

Former J.H. Baxter Wood Treating Facility
Arlington, Washington

**NOTES:**

1. Results in ug/L (microgram per liter)

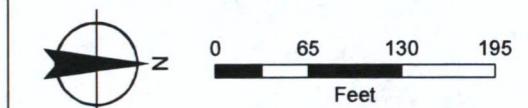
2. Abbreviations:

J Estimated Value

NA Not Analyzed

N Tentatively Identified Analyte

U Not Detected Above the Reporting Limit

**MAP NOTES:**

Date: March 12, 2015

Data Sources: AMEC, ESRI, Air photo taken on July 9, 2010 by Microsoft

Figure 7
Pentachlorophenol (PCP) Oxidized vs Persulfate Used
at Day 49
Former J.H. Baxter Co. Wood Treating Facility
Arlington, Washington

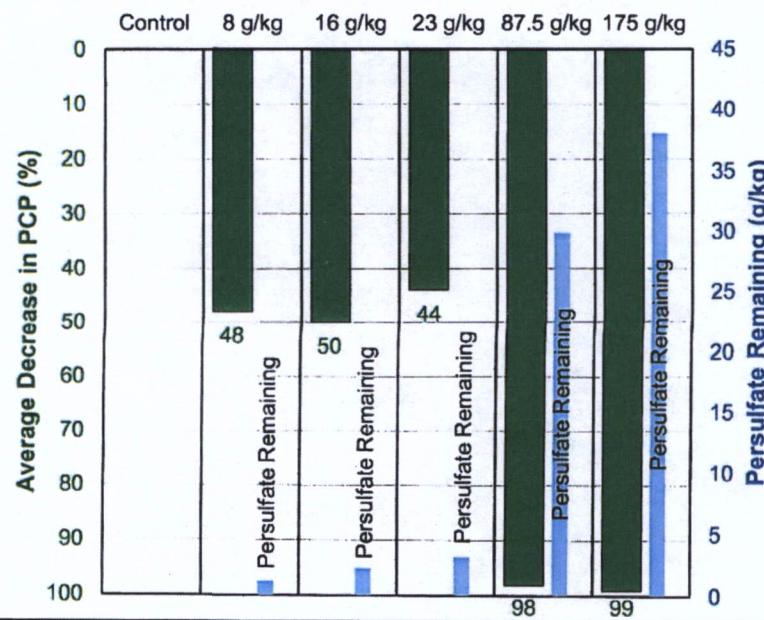
Sample SB-A: 24-27

Persulfate Dose	Average % Decrease in PCP	Persulfate Remaining (g/kg)
Control	0	0
8 g/kg	48	1.2
16 g/kg	50	2.2
23 g/kg	44	3.2
87.5 g/kg	98	29.9
175 g/kg	99	38.1

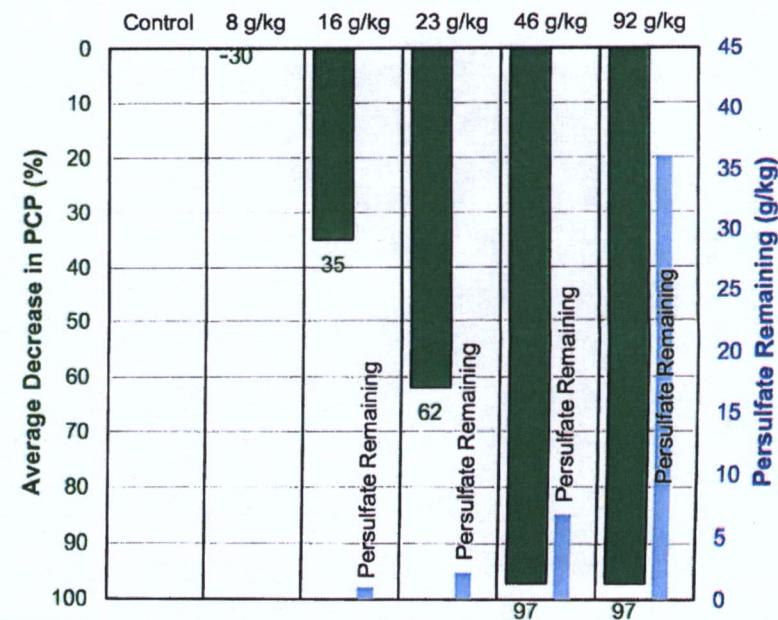
Sample SB-D: 30-33

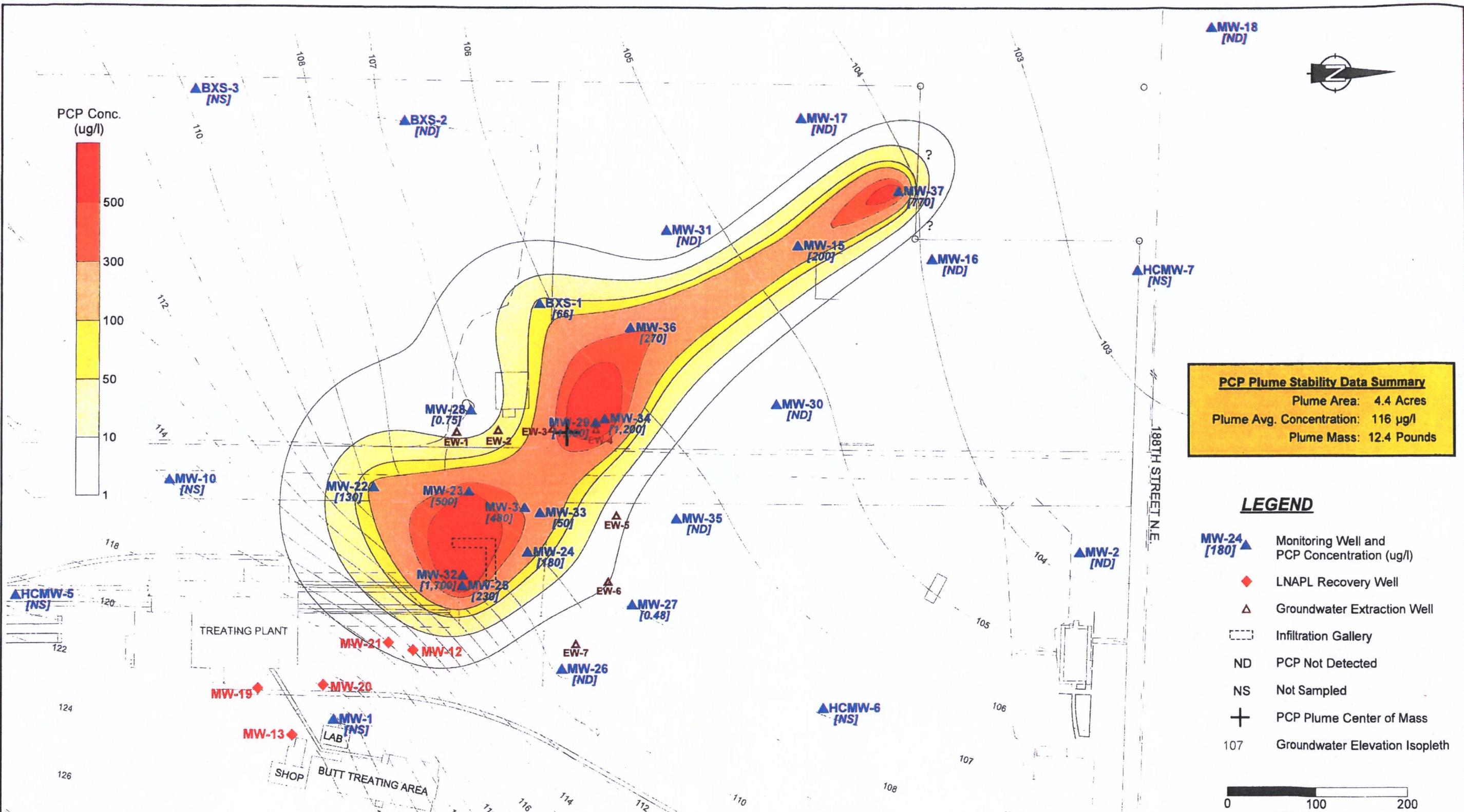
Persulfate Dose	Average % Decrease in PCP	Persulfate Remaining (g/kg)
Control	0	0
8 g/kg	-30	0
16 g/kg	35	1
23 g/kg	62	2.2
46 g/kg	97	6.8
92 g/kg	97	36.1

Sample SB-A: 24-27 Summary of Bench Oxidation Effectiveness Testing at Day 49

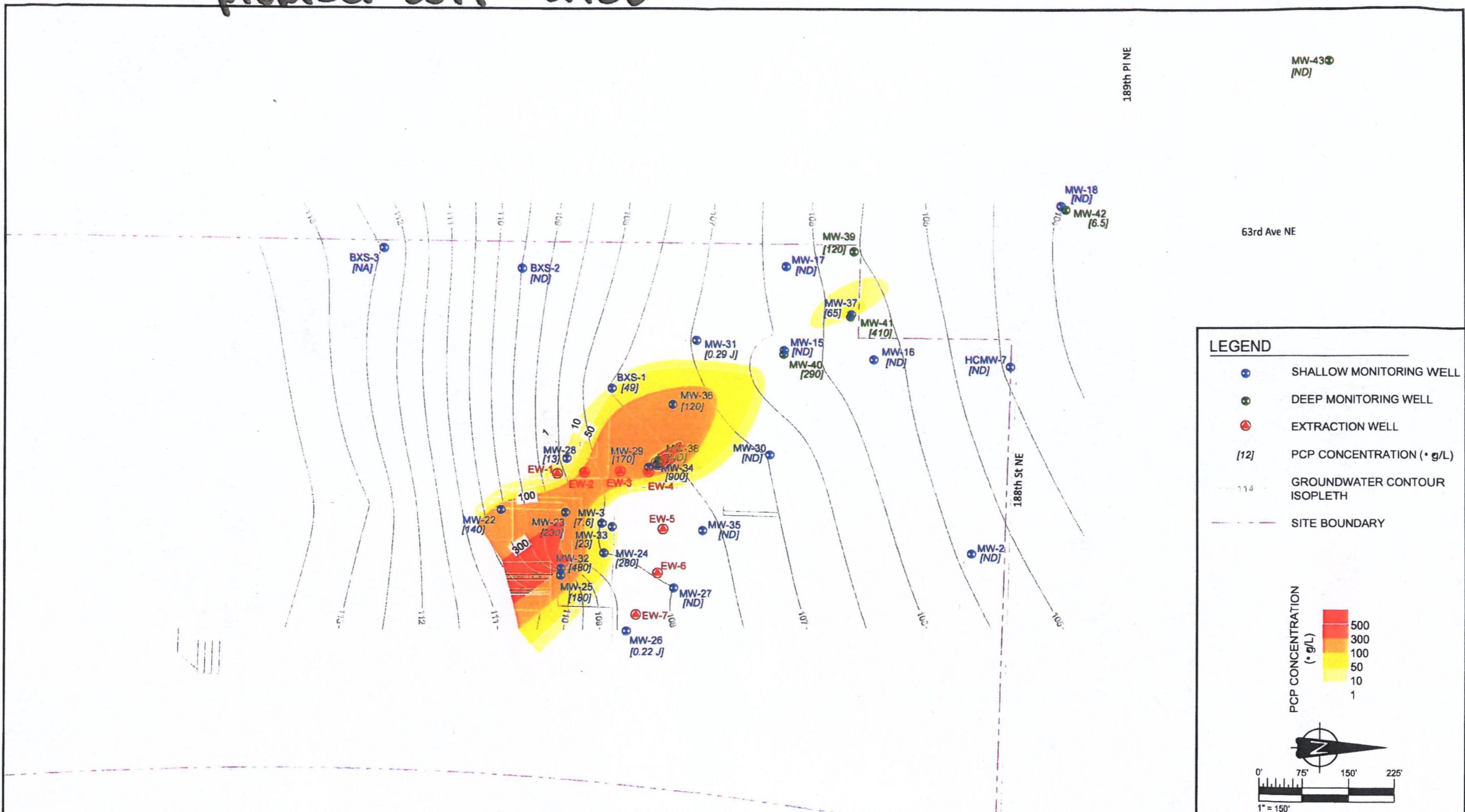


Sample SB-D: 30-33 Summary of Bench Oxidation Effectiveness Testing at Day 49





September 2014 - SADD

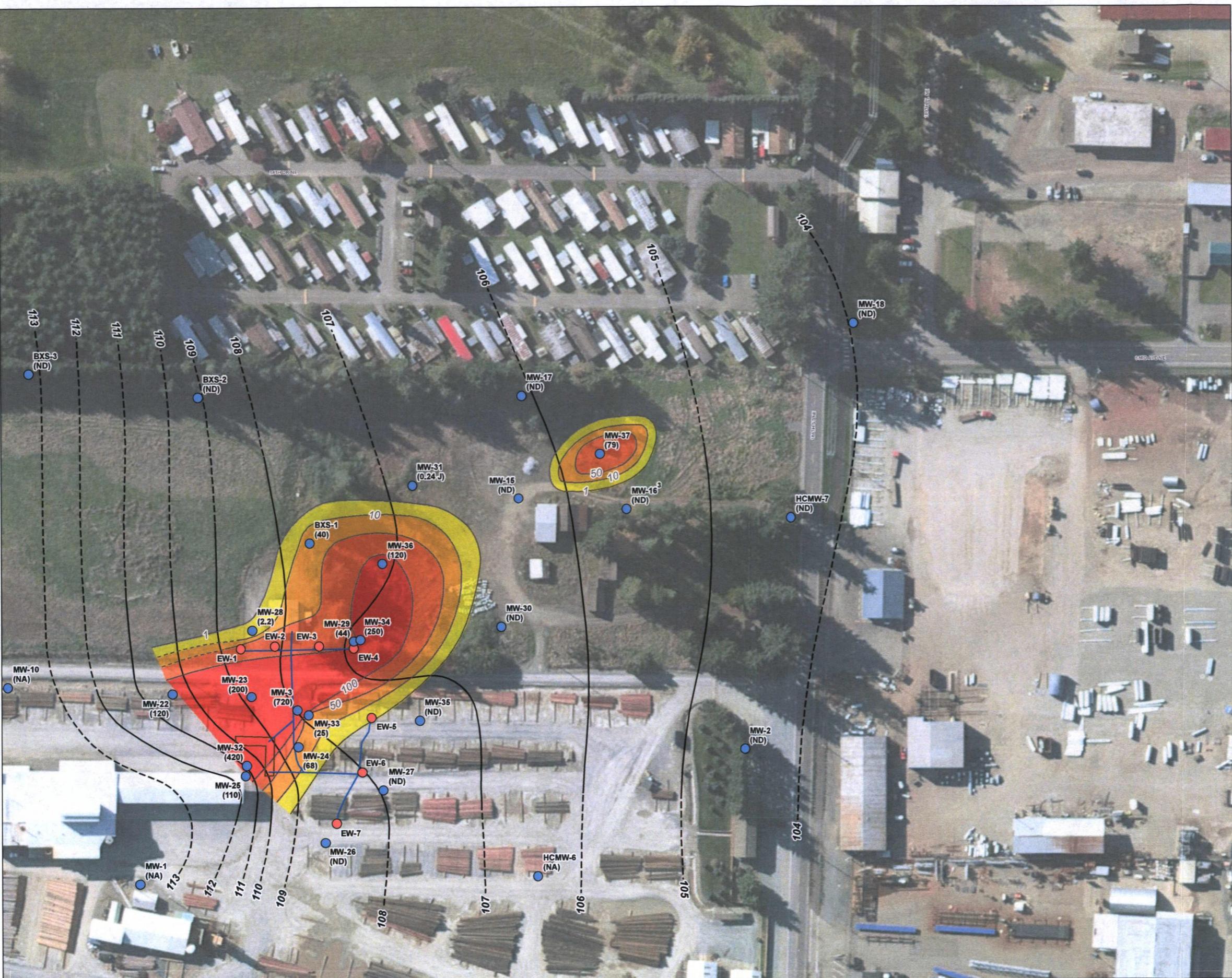


NOTES:		CLIENT:	PROJECT:			DATE:
UNITS	• g/L	J.H. BAXTER	PM/SD			DECEMBER 2014
J	Estimated Value		CHK'D BY:	SB		PROJECT NO.:
N	Tentatively Identified Analyte		DATUM:			461M125612.01.4
NA	Not Analyzed		TITLE:			REV. NO.:
ND	Undetected		PROJECTION:			A
NJ	Tentatively Identified Analyte; Estimated Value		SCALE:	1"=150'		FIGURE NO.:
		AMEC 7376 S.W. Durham Road Portland, OR U.S.A. 97224	amec			34

FIGURE 15

Pentachlorophenol Isopleth Map:
Fourth Quarter 2014

Former J.H. Baxter Wood Treating Facility
Arlington, Washington



LEGEND

- Monitoring Well and Pentachlorophenol (PCP) Concentration (ug/L) November 2014

Pentachlorophenol Concentrations (ug/L)

>100
>50 - 100
>10 - 50
>1 - 10

All Other Features

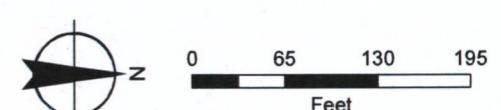
- Extraction Well
- Infiltration Gallery Piping

Infiltration Trench

Groundwater Elevation Contours (dashed where inferred)

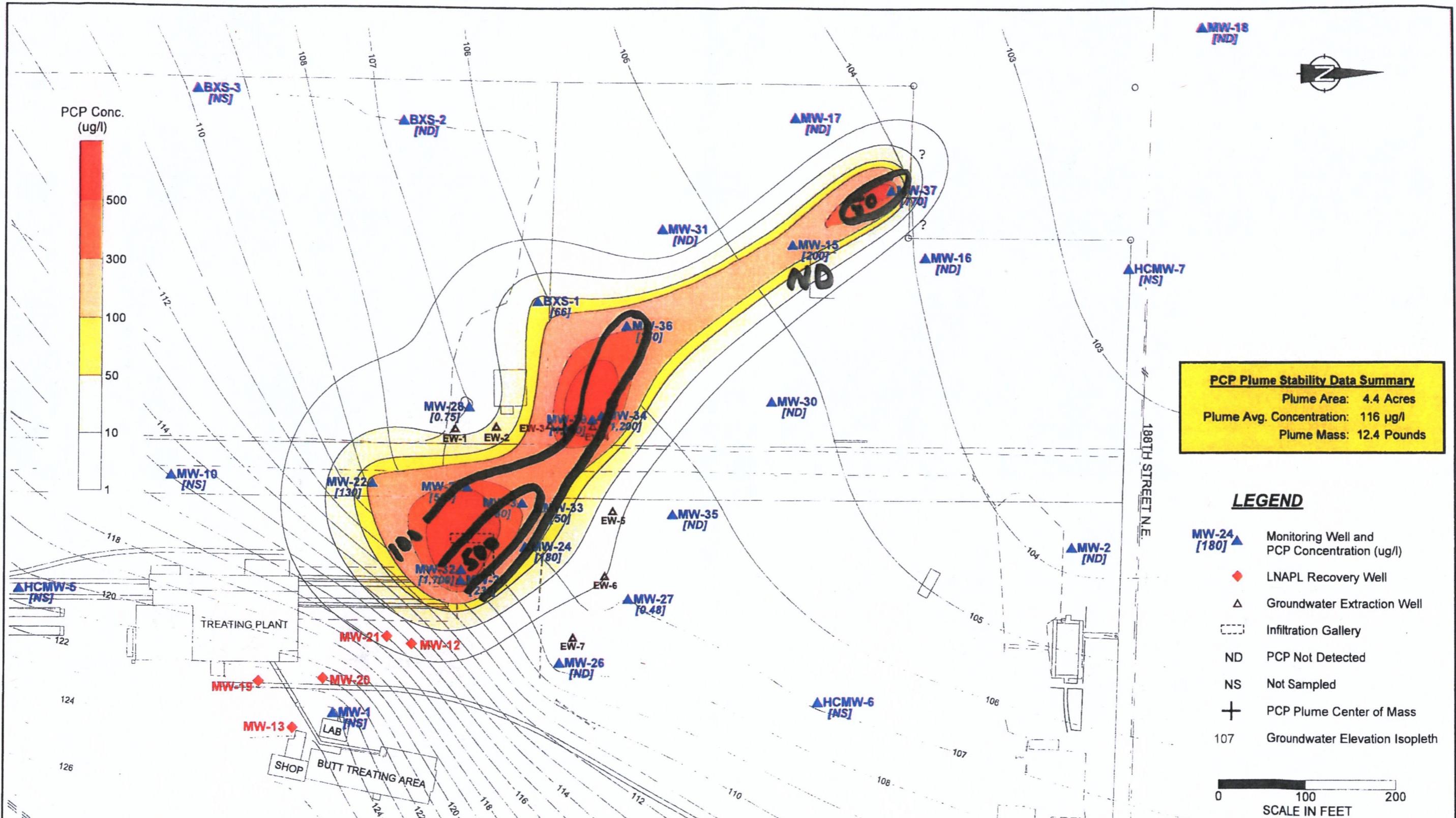
NOTES:

- Results in ug/L (microgram per liter)
- All elevations exist in NAVD88.
- Groundwater elevation measured at MW-16 not included in contours.
- Abbreviations:
 - J Estimated Value
 - NA Not Analyzed
 - ND Not-Detected



MAP NOTES:

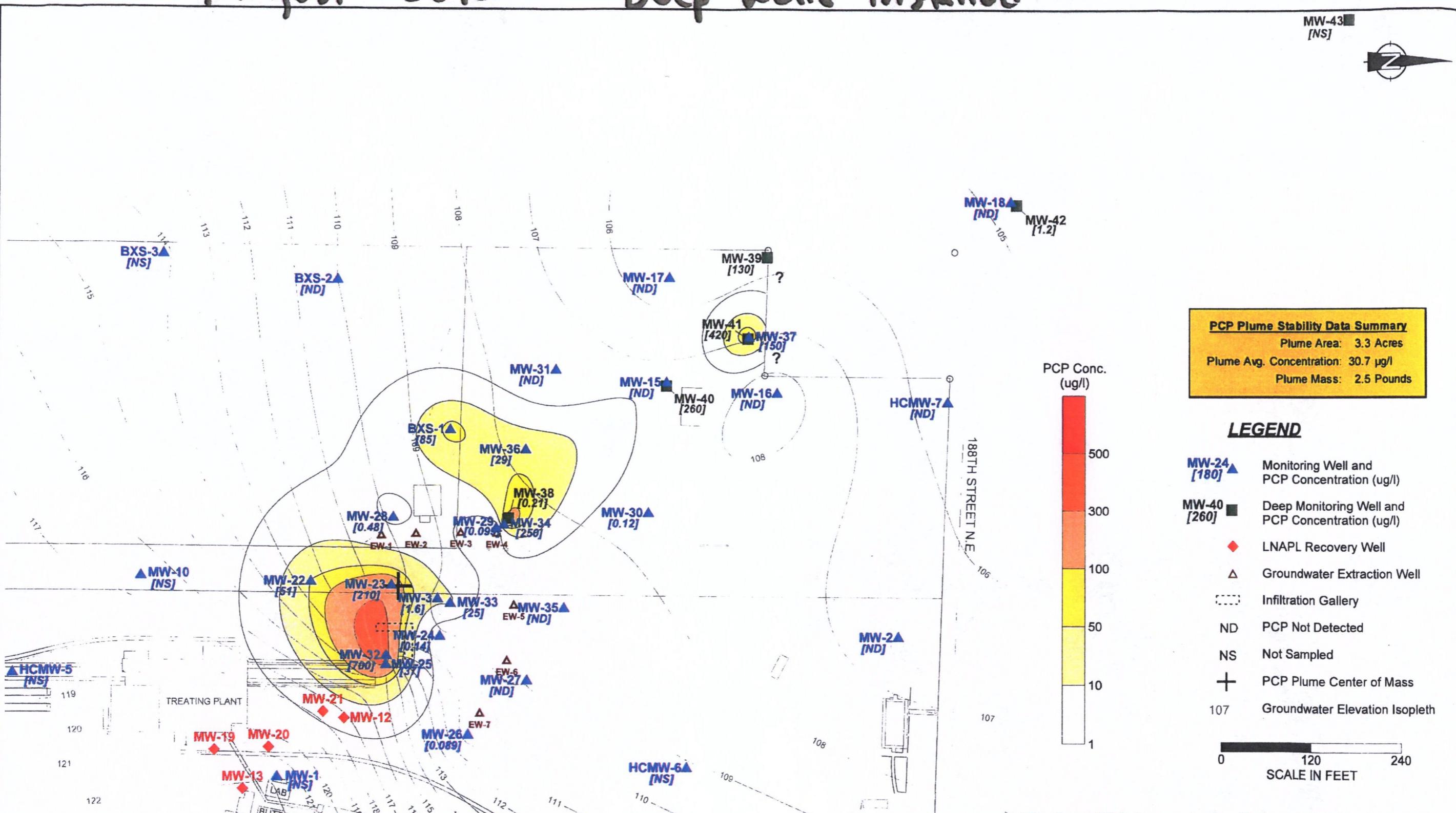
Date: March 12, 2015
Data Sources: AMEC, ESRI, Air photo taken on July 9, 2010 by Microsoft



August - 2010

Deep Wells Installed

MW-43
[NS]



PENTACHLOROPHENOL ISOPLETH MAP - August 2010
Former J.H. Baxter and Co. Wood Treating Facility
Arlington, Washington

Prepared By: JAR

Date: 03/13/14

Figure 17

11th day pm 2010 - not by treated by synth
L. Intn



FIGURE 20

Pentachlorophenol Isopleth Map,
Deep Zone:
Fourth Quarter 2014

Former J.H. Baxter Wood Treating Facility
Arlington, Washington

LEGEND

● Deep Monitoring Well and Pentachlorophenol
(PCP) Concentration (ug/L) November 2014

Pentachlorophenol Concentrations (ug/L)

>300
>100 - 300
>50 - 100
>10 - 50
>1 - 10

All Other Features

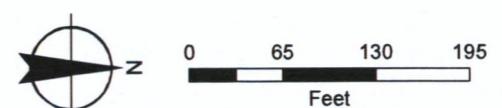
● Extraction Well

— Infiltration Gallery Piping

— Infiltration Trench

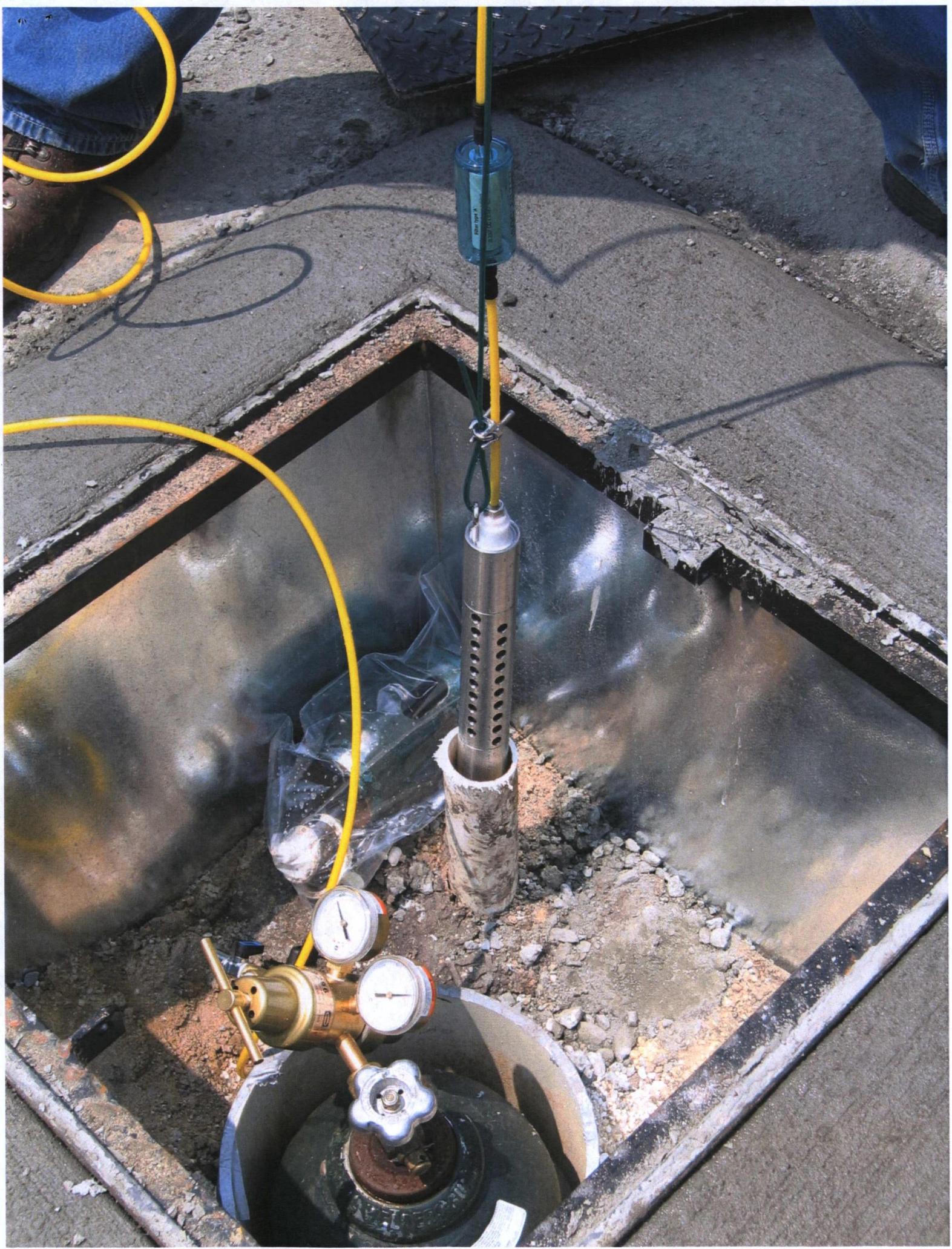
NOTES:

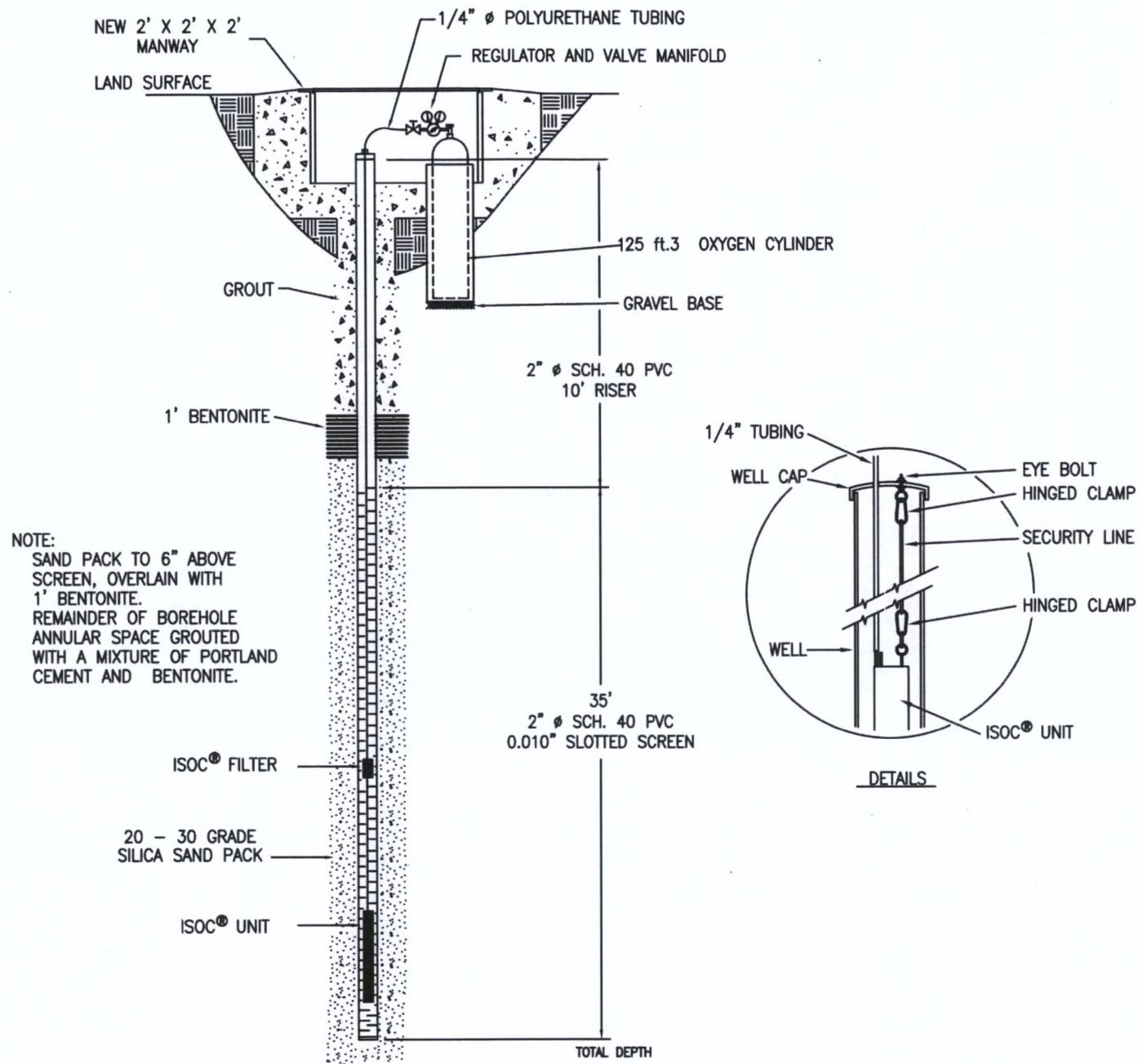
1. Results in ug/L (microgram per liter)
2. All elevations exist in NAVD88.
3. Abbreviations:
ND Not-Detected



MAP NOTES:

Date: March 12, 2015
Data Sources: AMEC, ESRI, Air photo taken on July 9, 2010 by Microsoft





LEGEND

SCALE:

NOT TO SCALE

PREPARED FOR:

SITE ADDRESS:

DRAWN BY:

DATE DRAWN:

JOB NUMBER:

FIGURE TITLE:

ISOC® WELL DETAILS

FIGURE
NUMBER: